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Autonomous Vehicle TEST & DEVELOPMENT Symposium 2016

31 MAY - 2 JUNE 2016 STUTTGART, GERMANY

The world's **ONLY** conference dedicated to the **testing** and **development procedures** for autonomous vehicles and advanced driver assistance systems

ON-SITE PROGRAMME

Programme sponsored by

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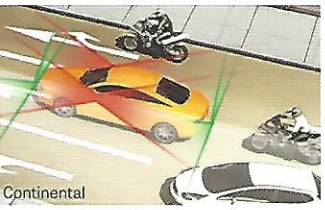
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Autonomous Vehicle
TEST & DEVELOPMENT
Symposium 2016

Welcome

Welcome to Stuttgart Messe and to the second annual Autonomous Vehicle Test & Development Symposium! Over the past 12 months, automotive manufacturers and Tier 1 suppliers, technology giants, government transportation departments and research organisations have increased the introduction of autonomous vehicle trials. Although there are still no clear sets of defined rules and regulations for automated driving and autonomous vehicles, it is clear that the rigorousness and thoroughness of the testing processes need to be at an altogether higher level of fidelity than anything that has gone before, if the final reality is to be achieved with complete safety and integrity guaranteed.

Throughout the next three days, the team and I will be available to answer any of your questions regarding this year's conference and the 2017 event. Andrew Boakes has been responsible for putting together this year's fantastic programme, and you will find him and our technician in the speaker room, which is situated next to the conference rooms. Additional passes are available if any of your colleagues wish to participate in this conference; please see our registration staff at the main entrance to purchase additional passes. All the conference proceedings will be available online through our web portal a few days after the event, and we will supply all attendees and speakers with login and password details via email.

In addition to the packed conference programme, we are offering a great networking opportunity – a free-to-attend drinks party exclusively for conference delegates and speakers, outside Hall 1 between 17:00hrs and 18:30hrs on Wednesday.

We will soon be opening the call for speakers for the 2017 conference. If you are interested in becoming a speaker, please talk to Andrew.

Finally, I am delighted to announce that we will be hosting two brand-new conferences alongside Automotive Testing Expo North America in Novi, Detroit, on October 25-26, 2016: **Autonomous Vehicle Safety Regulation World Congress** and **Autonomous Vehicle Interior Design & Technology Symposium**. For full details on these exciting new events, please see the conference page on our website (www.ukipme.com/conferences) or find either Andrew or myself and we'll be happy to discuss opportunities further.

In the meantime, I hope you enjoy the next three days and hope to see you back here in 2017.

Mike Robinson, director, UKIP Media & Events Conference Division

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DAY 1 TUE

09:00 - 12:

Presentati

ROOM A

Moderator - Heat
Technologies Inc, U

09:00 - The Volvo
project 'Drive me'
Carina Björnsson, t
active safety test m
A presentation of the
me. Why we do it and
that we have experie
What technology do
vehicle?

VOLVO

09:30 - A HIL-bas
function validatio
Dr Donato Amoroso
modelling engineer,
Dr Claudio D'Avino, s
We made a HIL (hardw
suitable for ADAS fun
of traditional ADAS te
vehicle test bench, i.e.
the whole electronic s
usually used to perfor
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FCA
FIAT CHRYSLER AUTOMOBILES

10:00 - Project Co
Ko-HAF
Dr Stefan Lüke, proj
Chassis & Safety, Ge
The presentation give
which focuses on high
scenarios. Ko-HAF is a
the German Federal M
The presentation show
content to handle thes
called safety server, is
of different partners.
landmark information,
project work relates t
controllability, driving

Continental

10:30 - 11:00 - B

DAY 3 THURSDAY 2 JUNE

09:00 - 16:15 - Real-World and Open-Road Testing

ROOM B

Moderator - Prof Frank Flemisch, branch head, Fraunhofer FKIE, Germany

09:00 - **Automated traffic – what the public sector should do**

Aki Lumiaho, principal scientist, VTT Technical Research Centre of Finland Ltd, Finland

The transport agency responsible for the road network and the transport safety agency responsible for safety aspects of traffic have agreed on an action plan to cover all relevant actions to enable automated traffic in Finland by 2020. The action plan includes legislative, strategic, technical, operational and maintenance activities that address road infrastructure, road equipment and utilities, driver aspects, vehicle-related topics and road user services. The schedule for activities covers years 2016-20. The main emphasis is on removing obstacles from successful testing and automated traffic as well as testing autonomous/automated vehicles on open roads. The actions are described.

09:30 - **GATEway: testing of automated vehicles in Greenwich, London**

Prof Nick Reed, academy director, TRL, UK

The GATEway project is one of the three studies funded by Innovate UK, the UK Government agency responsible for innovation. It is investigating user perceptions of automated vehicles in the urban environment, with trials of driverless shuttle vehicles, autonomous valet parking and automated deliveries. The presentation will describe progress made in procuring vehicles to deliver these trials, the process of implementation of the three studies and any results achieved to date.

10:00 - **UK Government approach to connected and autonomous vehicles**

Austen Okonweze, head of research and development, Centre for Connected and Autonomous Vehicles, UK

The UK is seen as one of the best places in the world for the research, development and demonstration of connected and autonomous vehicles. This talk will set out the work that the UK Government is doing to create a vibrant connected and autonomous vehicle industry to ensure that the UK maintains world-leading capability and remains one of the best places to develop new connected and autonomous vehicles technologies.

Centre for Connected & Autonomous Vehicles

10:30 - 11:00 - Break

11:00 - **The yellow change interval – the laws of physics in opposition**

Brian Ceccarelli, owner, Talus Software, USA

Most of the world's yellow light durations at signalised intersections are set according to the guideline propagated by the Institute of Transportation Engineers (ITE). The guideline consists primarily of a maths equation that engineers apply to all vehicle movements. But the physics of the equation works only for straight-through unimpeded vehicle movements under specific preconditions. For turning or impeded traffic the equation fails, shorting the yellow and causing drivers to inadvertently run red lights and crash. Whether the driver is human or mechanical makes no difference – the laws of physics apply equally.

TALUS SOFTWARE

11:30 - **What do we learn from learning by doing?**

Edwin Nas, deputy project leader self-driving vehicles, Netherlands, Ministry of Infrastructure & the Environment, Netherlands

The Netherlands has put the subject of automated driving on the European agenda as it currently holds the EU presidency. The legislation has been changed and since 2015 it is possible to legally test on Dutch public roads. There are many initiatives and a testing procedure in place. But what does it mean to have test in practice? And what does it mean to work with innovation as a government? What can we learn from the much-needed interaction between industry and government? These lessons will be presented for both political and industry audience.

Ministerie van Infrastructuur en Milieu

12:00 - 13:00 - Lunch

13:00 - **Enabling autonomous vehicle optimisation through real-time congestion measurement**

Daniel Benhammou, CEO, Acyclica Inc, USA

Autonomous vehicles have the potential to reduce many of the ailments of modern-day congestion including improving safety and reducing emissions, not to mention improving a city's economic output by reducing the time people spend in traffic. In order to fully realise these goals, vehicles must have hyper-accurate information regarding the state of congestion at intersections. This paper discusses technology for measuring junction-by-junction travel times and delay by movement so that autonomous vehicles may efficiently plot routes that take advantage of actual network utilisation. Results of implementations in Seattle, USA, will be discussed.

Acyclica

13:30 - **LUTZ Pathfinder Pods: public shared space testing in the UK**

Rebecca Advani, senior technologist, Transport Systems Catapult, UK

The LUTZ Pathfinder project, led by the UK's Transport Systems Catapult, aims to assess the feasibility of using fully automated vehicles to provide a last-mile solution in urban areas. A unique aspect of this project is its use of shared spaces, where the vehicle mixes with pedestrians, cyclists (and dogs!), rather than travelling on the road. This aspect of the project presents a number of opportunities and challenges, which will be discussed in this presentation.

CATAPULT Transport Systems

14:00 - **UK Autodri autonomous vehic**

Chris Reeves, comm technologies, Horib

The UK Autodrive proj and Coventry, explori autonomous vehicles involves the demonstr pods designed for pe challenges and implic on UK roads, and asse presentation will disc some of the results to

MIRA

14:30 - 15:00 - E

15:00 - **Objective a ADAS**

Juergen Holzinger, GmbH, Austria

Based on on-road stu subjective impressio activated ADAS were for each driving situa graded on a scale of 1 different vehicles und subjective ratings an environment recogni This allows the expert combination with aut an objective evaluatio

AVL

SPEAKER

Rebecca Advani, se Catapult, UK

Rebecca industry Universi been on concentrating on ele Delta Motorsport in S vehicles at Transport these two sets of em other, and in general likely to affect transp Rebecca's current ro (including safety eng Pathfinder project.

Dr Donato Amoroso modeling engineer,

Donato Aerospa "Federic collabor Centre) - Flight Syste obtained a scholarsh Casaccia research ce EE Department in Po

Daniel Benhammou, CEO, Acyclica Inc, USA

Daniel is the president and chief engineer of Acyclica, the industry leader in travel-time and congestion management. Since he founded Acyclica in 2012, the company has grown not only as a leading provider of congestion sensing technology, but as a universal traffic data integrator providing traffic data services to many of the leading mapping and traffic providers across the world. Daniel has demonstrated his commitment to innovation in ITS by pioneering real-time adaptive traffic control algorithms and machine video technologies as founder and chief technical officer of Hamilton Signal before its acquisition by Iteris in 2009. Widely considered a thought leader in the industry, Daniel often publishes and speaks at industry events and trade journals. He holds degrees from MIT and the University of Colorado.

Adela Béres, head of customer projects, AdasWorks Ltd, Hungary

Adela studied Embedded Systems and received an MSc at the University of Novi Sad. After working at Robert Bosch Kft as a hardware developer on engine cooling systems, she joined ThyssenKrupp Presta Hungary as a functional safety engineer for EPS systems. In 2011 she became a system safety manager for 'limp home' function development, then from 2014 was a safety manager responsible for the in-house Autosar BSW, OS development and fault-tolerant EPS system development, also for steer-by-wire systems. In 2016 she joined AdasWorks Ltd, a company that develops artificial intelligence-based software for self-driving cars to make automated driving safe and affordable. Her responsibility is to build up and maintain compliance with automotive standards in the company for the relevant customer projects.

Carina Björnsson, technical expert, driver assistance and active safety test methods, Volvo Car Corporation, Sweden

Carina graduated as a MScEE from Chalmers University of Technology in 2001. She started her career at Volvo Car in the powertrain department working with engine management systems. In 2007 she joined the active safety team, where she was responsible for the verification of the pedestrian detection and full auto brake, which was set into production as a world first in 2010. She has also been involved in the development and specification of the dummies and propulsion devices used in verification of active safety functions, e.g. ballon cars, pedestrian dummies, soft animals. She has also worked with verification of functions in the new XC90. Since the beginning of 2015 she has held the position of technical expert within active safety and driver assistance test methods.

Steve Boyle, managing director, Moshon Data, UK

Steve has been employed in the ADAS testing field for 11 years, working with inertial navigation/GPS systems, driving robots and, more lately, vehicle target development. Moshon Data is helping to develop ADAS testing on the test track and the open road.

Larry Cathey, senior technical advisor/business development engineer, Realtime Technologies Inc, USA

Larry was a research engineer at the Ford Research Laboratory in Dearborn, Michigan, from 1976 to 2007. During his last 15 years at Ford, he was involved in driving simulators for active safety and human-in-the-loop testing. He retired from Ford in 2007. Larry then worked at Realtime Technologies Inc from 2007 through 2014 as a senior project manager for research driving simulators. In 2015 he became driving simulator lab manager at the VAIL lab at Stanford University. He returned to RTI in 2016 as a senior technical advisor working on research driving simulators. His focus is on university research programmes and OEM support. Larry is a Wayne State University alumnus, with a Bachelor's degree in Computer Science and a Master's in Electrical and Computer Control Systems.

Brian Ceccarelli, owner, Talus Software, USA

Brian is just a common driver who was flashed by a red light camera back in 2009. When he saw the camera flash in his rear-view mirror, he knew that the yellow light duration somehow violated Newton's Second Law of Motion. The yellow was too short. There was nothing he could do to obey the traffic signal. Upon investigation, he discovered a cornucopia of physics errors in North Carolina's traffic signal timing specifications. These faulty specifications are the world's specifications and propagated by the Institute of Transportation Engineers as well as the National Board of Engineers in the USA. Brian was a panelist in ITE's traffic signal timings discussion in its 2015 international convention. He holds a degree in Physics from the University of Arizona.

Chris Clark, principal security engineer - global solutions, Synopsys, UK

Chris is a 22-year veteran of the information technology world and uses his background to help organisations effectively integrate meaningful security practices into their environments. Chris has worn many hats, including roles as project manager, director of information systems, hospital system CIO and principal security engineer educating customers on how to minimise their cybersecurity risks. By engaging with customers and sharing his knowledge and experiences, Chris hopes to help build a more resilient and secure world.

Nicholas Clay, senior manager - testing, Thatcham Research, UK

Nick has responsibility for all of Thatcham Research's safety testing, both passive and active. Working closely with vehicle manufacturers and Euro NCAP, the highly skilled and experienced testing teams deliver Euro NCAP test programmes and manufacturer development testing. The team also conduct research testing into new autonomous systems as part of protocol development and evaluating test equipment. Nick works closely with Global NCAP promoting ADAS technologies and safety systems. Before joining Thatcham, he spent over 10 years at VCA (the UK type approval authority), where he was responsible for certification and conformity of production as well as working with the UK Department for Transport and the European Commission on research and enforcement programmes. Nick is a Chartered Mechanical Engineer and sits on the Institution of Mechanical Engineers Automotive Division board.

Dr Claudio D'Avino, specialist engineer, Teoresi Group, Italy

Claudio received a Master's degree in Biomedical Engineering (summa cum laude) from the University of Naples Federico II in 2012. From 2012 until 2013 he was a scholarship holder within the IESWECAN training project for embedded software engineers, in cooperation with the University of Naples Federico II and Fiat Chrysler Automobiles (FCA), dealing with electromagnetic compatibility in automotive. Since January 2014 he has been an FCA technical consultant on behalf of Teoresi Group. His main activity is testing and validation of electronic control units (ECUs) involved in distributed vehicle functions.

Dr Saskia de Craen, senior researcher, SWOV Institute for Road Safety Research, Netherlands

Saskia has been a researcher at SWOV Institute for Road Safety Research since 2000. As psychologist specialised in Methodology and Psychometrics (MSc, Leiden University) she has worked on several traffic safety subjects, such as accompanied driving, (second phase) driver education and powered two-wheeler safety. In 2010